

IN THE CLAIMS

Please amend the claims as follows:

1. (Currently amended) A bistable nematic liquid crystal device comprising:
 - a first cell wall and a second cell wall enclosing a layer of nematic liquid crystal material;
 - electrodes for applying an electric field across at least some of said liquid crystal material;
 - a surface alignment on the inner surface of at least said first cell wall providing an alignment to the liquid crystal molecules;
 - wherein said surface alignment comprises an array of posts which have at least one of a shape and an orientation to induce a liquid crystal director adjacent said posts to adopt two different tilt angles in substantially the same azimuthal direction; and
 - wherein said posts are arranged in one of a random or pseudorandom array;
 - the arrangement being such that two stable liquid crystal molecular configurations can exist after suitable electrical signals have been applied to said electrodes.
2. (Previously presented) A device as claimed in claim 1, wherein said liquid crystal material has negative dielectric anisotropy and wherein said second cell wall has a surface alignment which induces a local homeotropic alignment of said liquid crystal director.
3. (Cancelled)

4. (Previously presented) A device as claimed in claim 1, wherein said posts have a height in the range of about 0.5 to 5 μm .

5. (Previously presented) A device as claimed in claim 1, wherein said posts have a height in the range of about 0.9 to 1.3 μm and the spacing between the cell walls is about 3 μm .

6. (Previously presented) A device as claimed in claim 1, wherein at least part of a side wall of said posts is tilted at a tilt angle with respect to the normal to the plane of said first cell wall.

7. (Previously presented) A device as claimed in claim 6, wherein said tilt angle is in the range of about 5 to 7°.

8. (Previously presented) A device as claimed in claim 6, wherein said tilt angle is about 5°.

9. (Previously presented) A device as claimed in claim 1, wherein said posts each have a width in the range of about 0.2 to 3 μm .

10. (Cancelled)

11. (Previously presented) A device as claimed in claim 1, wherein said posts are spaced in the range of about from 0.1 to 5 μm apart from each other.

12. (Previously presented) A device as claimed in claim 1, wherein said liquid crystal material contains a surfactant.

13. (Previously presented) A device as claimed in claim 1, wherein said posts are formed from at least one of a photoresist or a plastics material.

14. (Original) A device as claimed in claim 1, further including an analyser and a polariser mounted on the cell walls.

15. (Previously presented) A device as claimed in claim 1, wherein said posts each have a surface comprising a material which is in contact with said liquid crystal material, excluding any material which induces homeotropic alignment in liquid crystal materials.

16. (Previously presented) A device as claimed in claim 1, wherein said second wall has a surface alignment comprising an array of features which have at least one of a shape and an orientation to induce a liquid crystal director adjacent the features to adopt two different tilt angles in substantially the same azimuthal direction.

17. (Previously presented) A device as claimed in claim 1, wherein said liquid crystal material has a pleochroic dye dissolved therein.

18. (Previously presented) A device as claimed in claim 1, wherein said at least one of the shape and the orientation of said posts is such as to favour only one azimuthal director orientation adjacent said posts, and this orientation is the same for each post.

19. (Previously presented) A device as claimed in claim 1, wherein said at least one of the shape and the orientation of said posts is such as to favour only one azimuthal director orientation adjacent said posts, and this orientation varies from post to post so as to give a scattering effect in one of the two stable liquid crystal molecular configurations.

20. (Previously presented) A device as claimed in claim 1, wherein an inner surface of said second cell wall is provided with an alignment which

induces a local liquid crystal director to adopt a planar alignment in substantially the same azimuthal direction induced by the alignment on the surface of the first cell wall.

21. (Previously presented) A device as claimed in claim 1, wherein said liquid crystal director twists between said first cell wall and said second cell wall.

22. (Previously presented) A device as claimed in claim 21, wherein said twist is induced by chiral doping of said liquid crystal material.

23. (Previously presented) A device as claimed in claim 21, wherein said twist is induced by treatment of said second cell wall to produce one of a planar or a tilted planar alignment of a local liquid crystal director at a non-zero angle to the azimuthal direction induced by said posts on said first cell wall.

24. (Previously presented) A device as claimed in claim 1, wherein said posts are formed from a material, excluding any material which induces homeotropic alignment in liquid crystal materials.

25. (Previously presented) A device as claimed in claim 6, wherein said posts are cylindrical.

26. (Previously presented) A device as claimed in claim 6, wherein said posts have a square cross section.

27. (Previously presented) A device as claimed in claim 1, wherein said posts have a cross section selected from an oval shape and a diamond shape.

28. (Cancelled)

29. (Cancelled)

30. (New) A bistable nematic liquid crystal device comprising:
a first cell wall and a second cell wall enclosing a layer of nematic liquid crystal material;
electrodes for applying an electric field across at least some of said liquid crystal material;
a surface alignment on the inner surface of at least said first cell wall providing an alignment to the liquid crystal molecules;
wherein said surface alignment comprises an array of posts which have at least one of a shape and an orientation to induce a liquid crystal director adjacent said posts to adopt two different tilt angles in substantially the same azimuthal direction;
wherein at least part of a side wall of said posts is tilted at a tilt angle with respect to the normal to the plane of said first cell wall; and
wherein said tilt angle is in the range of about 5 to 7°;
the arrangement being such that two stable liquid crystal molecular configurations can exist after suitable electrical signals have been applied to said electrodes.

31. (New) A device as claimed in claim 30, wherein said liquid crystal material has negative dielectric anisotropy and wherein said second cell wall has a surface alignment which induces a local homeotropic alignment of said liquid crystal director.

32. (New) A device as claimed in claim 30, wherein said posts have a height in the range of about 0.5 to 5 μm .

33. (New) A device as claimed in claim 30, wherein said posts have a height in the range of about 0.9 to 1.3 μm and the spacing between the cell walls is about 3 μm .

34. (New) A device as claimed in claim 30, wherein said tilt angle is about 5°.

35. (New) A device as claimed in claim 30, wherein said posts each have a width in the range of about 0.2 to 3 μm .

36. (New) A device as claimed in claim 30, wherein said posts are arranged in one of a random or pseudorandom array.

37. (New) A device as claimed in claim 30, wherein said posts are spaced in the range of about from 0.1 to 5 μm apart from each other.

38. (New) A device as claimed in claim 30, wherein said liquid crystal material contains a surfactant.

39. (New) A device as claimed in claim 30, wherein said posts are formed from at least one of a photoresist or a plastics material.

40. (New) A device as claimed in claim 30, further including an analyser and a polariser mounted on the cell walls.

41. (New) A device as claimed in claim 30, wherein said posts each have a surface comprising a material which is in contact with said liquid crystal material, excluding any material which induces homeotropic alignment in liquid crystal materials.

42. (New) A device as claimed in claim 30, wherein said second wall has a surface alignment comprising an array of features which have at least one of a shape and an orientation to induce a liquid crystal director adjacent the features to adopt two different tilt angles in substantially the same azimuthal direction.

43. (New) A device as claimed in claim 30, wherein said liquid crystal material has a pleochroic dye dissolved therein.

44. (New) A device as claimed in claim 30, wherein said at least one of the shape and the orientation of said posts is such as to favour only one azimuthal director orientation adjacent said posts, and this orientation is the same for each post.

45. (New) A device as claimed in claim 30, wherein said at least one of the shape and the orientation of said posts is such as to favour only one azimuthal director orientation adjacent said posts, and this orientation varies from post to post so as to give a scattering effect in one of the two stable liquid crystal molecular configurations.

46. (New) A device as claimed in claim 30, wherein an inner surface of said second cell wall is provided with an alignment which induces a local liquid crystal director to adopt a planar alignment in substantially the same azimuthal direction induced by the alignment on the surface of the first cell wall.

47. (New) A device as claimed in claim 30, wherein said liquid crystal director twists between said first cell wall and said second cell wall.

48. (New) A device as claimed in claim 47, wherein said twist is induced by chiral doping of said liquid crystal material.

49. (New) A device as claimed in claim 47, wherein said twist is induced by treatment of said second cell wall to produce one of a planar or a tilted planar alignment of a local liquid crystal director at a non-zero angle to the azimuthal direction induced by said posts on said first cell wall.

50. (New) A device as claimed in claim 30, wherein said posts are formed from a material, excluding any material which induces homeotropic alignment in liquid crystal materials.

51. (New) A device as claimed in claim 30, wherein said posts are cylindrical.

52. (New) A device as claimed in claim 30, wherein said posts have a square cross section.

53. (New) A device as claimed in claim 30, wherein said posts have a cross section selected from an oval shape and a diamond shape.

54. (New) A bistable nematic liquid crystal device comprising:
a first cell wall and a second cell wall enclosing a layer of nematic liquid crystal material;

electrodes for applying an electric field across at least some of said liquid crystal material;

a surface alignment on the inner surface of at least said first cell wall providing an alignment to the liquid crystal molecules;

wherein said surface alignment comprises an array of posts which have at least one of a shape and an orientation to induce a liquid crystal director adjacent said posts to adopt two different tilt angles in substantially the same azimuthal direction;

wherein said posts have a cross section selected from the group consisting of circle shape, square shape, oval shape, and diamond shape;

the arrangement being such that two stable liquid crystal molecular configurations can exist after suitable electrical signals have been applied to said electrodes.

55. (New) A device as claimed in claim 54, wherein said liquid crystal material has negative dielectric anisotropy and wherein said second cell wall has a surface alignment which induces a local homeotropic alignment of said liquid crystal director.

56. (New) A device as claimed in claim 54, wherein said posts have a height in the range of about 0.5 to 5 μm .

57. (New) A device as claimed in claim 54, wherein said posts have a height in the range of about 0.9 to 1.3 μm and the spacing between the cell walls is about 3 μm .

58. (New) A device as claimed in claim 54, wherein at least part of a side wall of said posts is tilted at a tilt angle with respect to the normal to the plane of said first cell wall.

59. (New) A device as claimed in claim 58, wherein said tilt angle is in the range of about 5 to 7°.

60. (New) A device as claimed in claim 59, wherein said tilt angle is about 5°.

61. (New) A device as claimed in claim 54, wherein said posts each have a width in the range of about 0.2 to 3 μm .

62. (New) A device as claimed in claim 54, wherein said posts are arranged in one of a random or pseudorandom array.

63. (New) A device as claimed in claim 54, wherein said posts are spaced in the range of about from 0.1 to 5 μm apart from each other.

64. (New) A device as claimed in claim 54, wherein said liquid crystal material contains a surfactant.

65. (New) A device as claimed in claim 54, wherein said posts are formed from at least one of a photoresist or a plastics material.

66. (New) A device as claimed in claim 54, further including an analyser and a polariser mounted on the cell walls.

67. (New) A device as claimed in claim 54, wherein said posts each have a surface comprising a material which is in contact with said liquid crystal material, excluding any material which induces homeotropic alignment in liquid crystal materials.

68. (New) A device as claimed in claim 54, wherein said second wall has a surface alignment comprising an array of features which have at least one of a shape and an orientation to induce a liquid crystal director adjacent the features to adopt two different tilt angles in substantially the same azimuthal direction.

69. (New) A device as claimed in claim 54, wherein said liquid crystal material has a pleochroic dye dissolved therein.

70. (New) A device as claimed in claim 54, wherein said at least one of the shape and the orientation of said posts is such as to favour only one azimuthal director orientation adjacent said posts, and this orientation is the same for each post.

71. (New) A device as claimed in claim 54, wherein said at least one of the shape and the orientation of said posts is such as to favour only one azimuthal director orientation adjacent said posts, and this orientation varies from post to post so as to give a scattering effect in one of the two stable liquid crystal molecular configurations.

72. (New) A device as claimed in claim 54, wherein an inner surface of said second cell wall is provided with an alignment which induces a local liquid crystal director to adopt a planar alignment in substantially the same azimuthal direction induced by the alignment on the surface of the first cell wall.

73. (New) A device as claimed in claim 54, wherein said liquid crystal director twists between said first cell wall and said second cell wall.

74. (New) A device as claimed in claim 73, wherein said twist is induced by chiral doping of said liquid crystal material.

75. (New) A device as claimed in claim 73, wherein said twist is induced by treatment of said second cell wall to produce one of a planar or a tilted planar alignment of a local liquid crystal director at a non-zero angle to the azimuthal direction induced by said posts on said first cell wall.

78. (New) A device as claimed in claim 54, wherein said posts are formed from a material, excluding any material which induces homeotropic alignment in liquid crystal materials.